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PERFORMANCE OF EXPERIMENTAL MODEL FLUTER
DURING OCTOBER AND NOVEMBER, 1959 .

✓ Project 1108-11

PRELIMINARY REPORT ONE

to

THE TECHNICAL COMMITTEE

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

December 9, 1959

PERFORMANCE OF EXPERIMENTAL MODEL FLUTER

DURING OCTOBER AND NOVEMBER, 1959

Progress Report Two, dated October 7, 1959, summarized initial results obtained using the experimental model Concora fluter. Additional data collected during October and November is summarized herein.

It may be recalled that daily checks on the performance were initiated in September employing three samples of 26-lb. medium (Roll numbers 3485, 3471, and 3521) and the sample of 33 lb. medium (Roll number 3513). This testing was carried through October and November at test intervals of about every other day. Continuous operation of the fluter throughout each working day was continued as in September in order to accelerate wear, etc., which might cause fluctuations in instrument level.

The October and November flat crush results are summarized in Tables I and II and the corresponding flute height results are tabulated in Tables III and IV. Monthly summaries of the data are shown in Tables V and VI. The results are also graphically illustrated in Figures 1 through 3. Reference to the tables or figures indicates that the flat crush results have been in reasonably good control for the 26-lb. medium samples. A slight decrease in flute height of about 1.5 to 2.0 points on the average has occurred during this period. Extrapolation of previous results would have indicated that small increases in flat crush should have been associated with the decrease in flute height; however, such extrapolation may not be justified.

Using the daily flat crush averages for all three months, the standard deviation of the sample averages was computed with the following results:

Roll	Grand Average, p.s.i.	Standard Deviation of Averages (n=20)	Per Cent Standard Deviation
3471	36.2	8.53	1.5
3485	32.9	0.40	1.2
3521	40.7	0.97	2.4
3513	48.0	1.64	3.4

The above indicates that approximately 95% of the time the sample averages for Roll 3485 fall within about $\pm 2.4\%$ of the grand average. Corresponding figures for the other two samples would be $\pm 3\%$ for Roll 3471 and $\pm 4.8\%$ for Roll 3521. Somewhat wider limits are associated with the 33-lb. medium sample (Roll 3513).

TABLE I

CONCORA FLAT CRUSH RESULTS FOR OCTOBER USING EXPERIMENTAL FLUTER

Date	Roll 3521		Concora Flat Crush, p.s.i. Roll 3471		Roll 3485		Roll 3513	
	Average	Range	Average	Range	Average	Range	Average	Range
10-7	40.89	6.0	37.56	3.6	33.57	5.4	48.33	6.6
10-9	41.19	8.4	36.33	4.2	32.88	4.2	47.22	9.0
10-12	41.07	7.8	36.33	6.0	33.21	4.8	48.00	5.4
10-14	41.67	6.6	36.48	4.8	32.49	3.6	48.39	6.6
10-16	42.48	5.4	36.51	5.4	33.21	4.2	48.51	11.4
10-20	40.29	7.8	35.16	6.0	32.85	4.2	47.16	8.4
10-22	41.64	10.8	36.75	4.2	32.70	3.6	44.25	6.6
10-26	40.62	7.8	36.00	5.4	32.94	4.8	50.74	7.8
10-29	41.34	7.2	36.45	4.2	33.21	4.2	48.93	10.2
Average	41.24	7.5	36.40	4.9	33.01	4.3	47.95	8.0
2-Sigma Limits								
Upper	42.14	10.4	36.99	6.8	33.53	6.0	48.91	11.1
Lower	40.34	4.6	35.81	3.0	32.49	2.6	46.99	4.9

TABLE II

CONCORA FLAT CRUSH RESULTS FOR NOVEMBER USING EXPERIMENTAL FLUTTER

Date	Concra Flat Crush, p.s.i.				Roll 3513	
	Roll 3521	Roll 3471	Roll 3485	Roll 3513	Average	Range
	Average	Average	Average	Average		
	Range	Range	Range	Range		
11-2	39.66	35.94	33.33	49.89	9.6	
11-4	40.35	36.78	32.34	47.58	14.4	
11-6	39.96	35.58	32.49	48.12	12.0	
11-9	40.29	35.79	32.97	45.06	6.6	
11-13	39.60	37.23	33.18	46.44	7.2	
11-16	40.38	36.72	33.00	49.71	13.8	
11-18	40.74	36.21	32.70	47.46	13.2	
11-20	41.61	36.27	32.37	46.80	10.8	
11-23	40.80	35.61	32.37	47.67	7.8	
11-25	40.26	36.24	32.61	46.05	7.8	
11-27	41.04	36.00	33.42	46.41	9.0	
11-30	40.92	35.94	32.76	48.51	10.2	
Average	40.47	36.19	32.80	47.48	10.2	
2-Sigma Limits						
Upper	41.24	36.78	33.28	48.70	14.2	
Lower	39.70	35.60	32.32	46.26	6.2	

TABLE III

FLUTE HEIGHT RESULTS FOR OCTOBER USING THE EXPERIMENTAL FLUTER

Date	Roll 3521		Flute Height (Fifth Flute), points				Roll 3513	
	Average	Range	Average	Range	Average	Range	Average	Range
10-7	202.9	8.0	203.4	6.5	203.2	5.0	202.6	8.0
10-9	203.2	4.0	203.5	3.5	202.6	7.0	202.3	7.0
10-12	202.2	4.5	202.0	3.5	202.4	4.0	200.2	10.5
10-14	202.2	4.5	202.8	5.5	203.5	5.0	199.3	9.5
10-16	202.2	5.0	203.3	6.0	203.5	3.5	201.2	10.0
10-20	202.2	3.5	202.6	5.0	202.5	5.0	200.9	8.5
10-22	201.7	4.5	203.2	4.0	202.1	6.0	196.4	8.5
10-26	201.8	3.5	202.5	4.0	202.1	4.5	197.7	11.0
10-29	202.2	3.0	202.5	3.5	202.4	3.0	200.6	8.5
Average	202.3	4.5	202.9	4.6	202.7	4.8	200.1	9.1
2-Sigma limits								
Upper	202.8	6.3	203.5	6.4	203.3	6.7	201.2	12.6
Lower	201.8	2.7	202.3	2.8	202.1	2.9	199.0	5.6

TABLE IV
FLUTE HEIGHT RESULTS FOR NOVEMBER USING THE EXPERIMENTAL FLUTER

Date	Roll 3521		Flute Height (Fifth Flute), points				Roll 3513	
	Average	Range	Average	Range	Average	Range	Average	Range
11-2	202.1	3.5	202.5	2.5	202.4	3.0	201.3	7.5
11-4	201.5	4.5	202.6	3.5	202.5	2.5	201.4	4.0
11-6	201.5	2.5	202.0	5.5	201.6	3.0	200.7	5.0
11-9	202.2	4.0	202.4	2.5	202.5	3.5	202.0	3.5
11-13	201.9	2.0	202.0	3.5	201.4	3.0	200.8	4.0
11-16	200.8	4.0	202.2	3.5	201.4	3.5	197.2	10.5
11-18	201.5	4.5	201.9	3.5	201.5	4.0	200.5	8.5
11-20	201.2	6.0	202.2	4.0	201.2	4.0	200.4	6.0
11-23	201.4	4.0	201.8	3.5	201.6	5.0	197.8	11.5
11-25	202.0	2.5	202.3	3.0	201.4	3.0	200.4	5.0
11-27	201.4	3.0	202.5	3.0	201.8	4.0	201.3	6.5
11-30	201.2	3.0	202.4	4.0	201.4	3.5	197.4	10.0
Average	201.6	3.6	202.2	3.5	201.7	3.5	200.1	6.8
2-Sigma Limits								
Upper	202.0	5.0	202.6	4.9	202.1	4.9	200.9	9.5
Lower	201.2	2.2	201.8	2.1	201.3	2.1	199.3	4.1

TABLE V

CONCORA FLAT CRUSH

Roll	September ^b	Flat Crush, p.s.i. October	% Diff. ^a	November	% Diff. ^a
3521	40.49	41.24	+1.85	40.47	-0.05
3471	36.10	36.40	+0.83	36.19	+0.25
3485	32.88	33.01	+0.40	32.80	-0.24
3513	48.07	47.95	-0.25	47.48	-1.23

^a Based on September results.

^b Taken from Progress Report Two, dated October 7, 1959.

TABLE VI

FLUTE HEIGHT
(Fifth Flute)

Roll	September ^b	Flute Height, points October	% Diff. ^a	November	% Diff. ^a
3521	203.1	202.3	-0.39	201.6	-0.74
3471	204.4	202.9	-0.73	202.2	-1.08
3485	203.5	202.7	-0.39	201.7	-0.88
3513	202.0	200.1	-0.94	200.1	-0.94

^a Based on September results.

^b Taken from Progress Report Two, dated October 7, 1959.

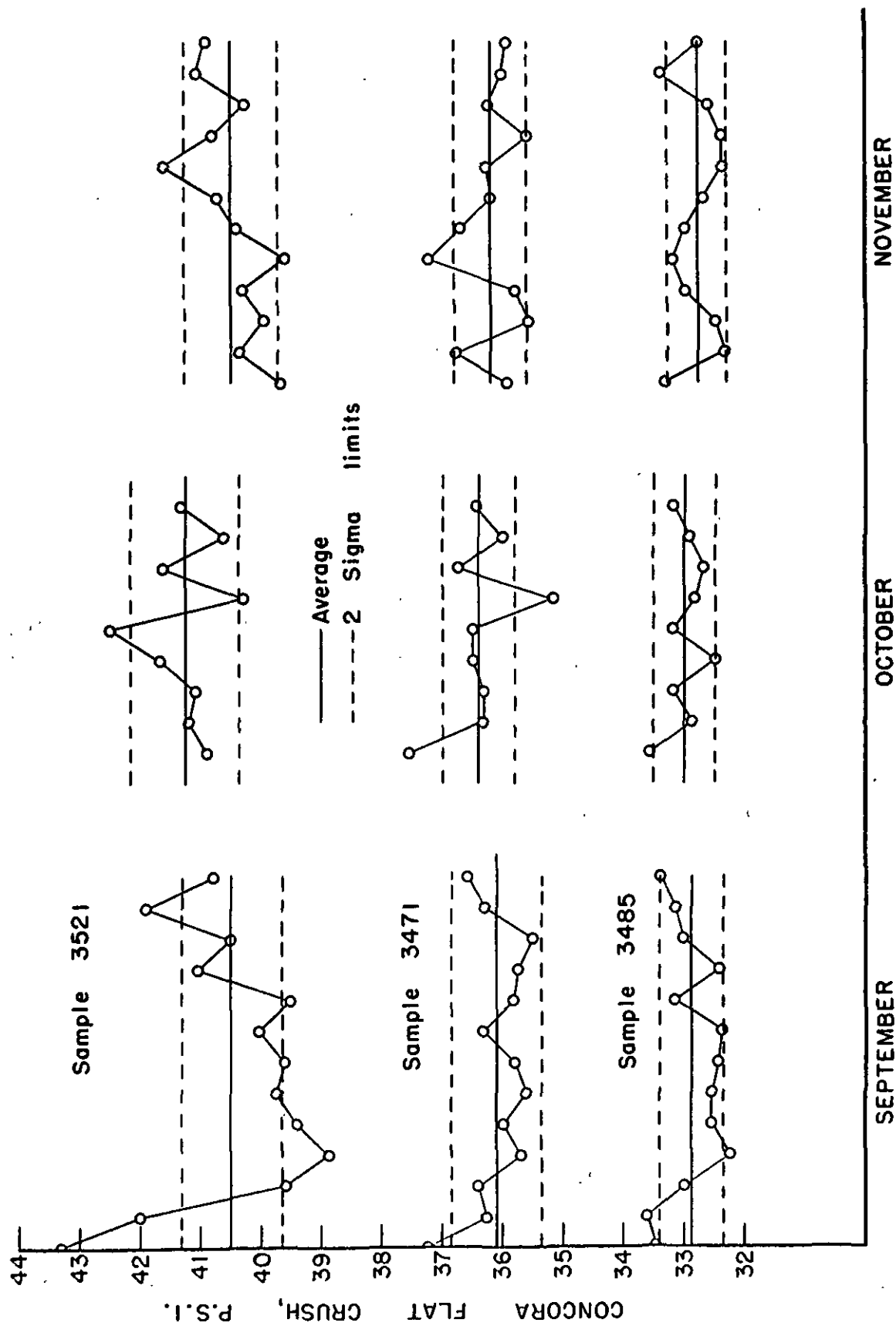


Figure 1. Flat Crush Results for 26-lb. Medium Samples

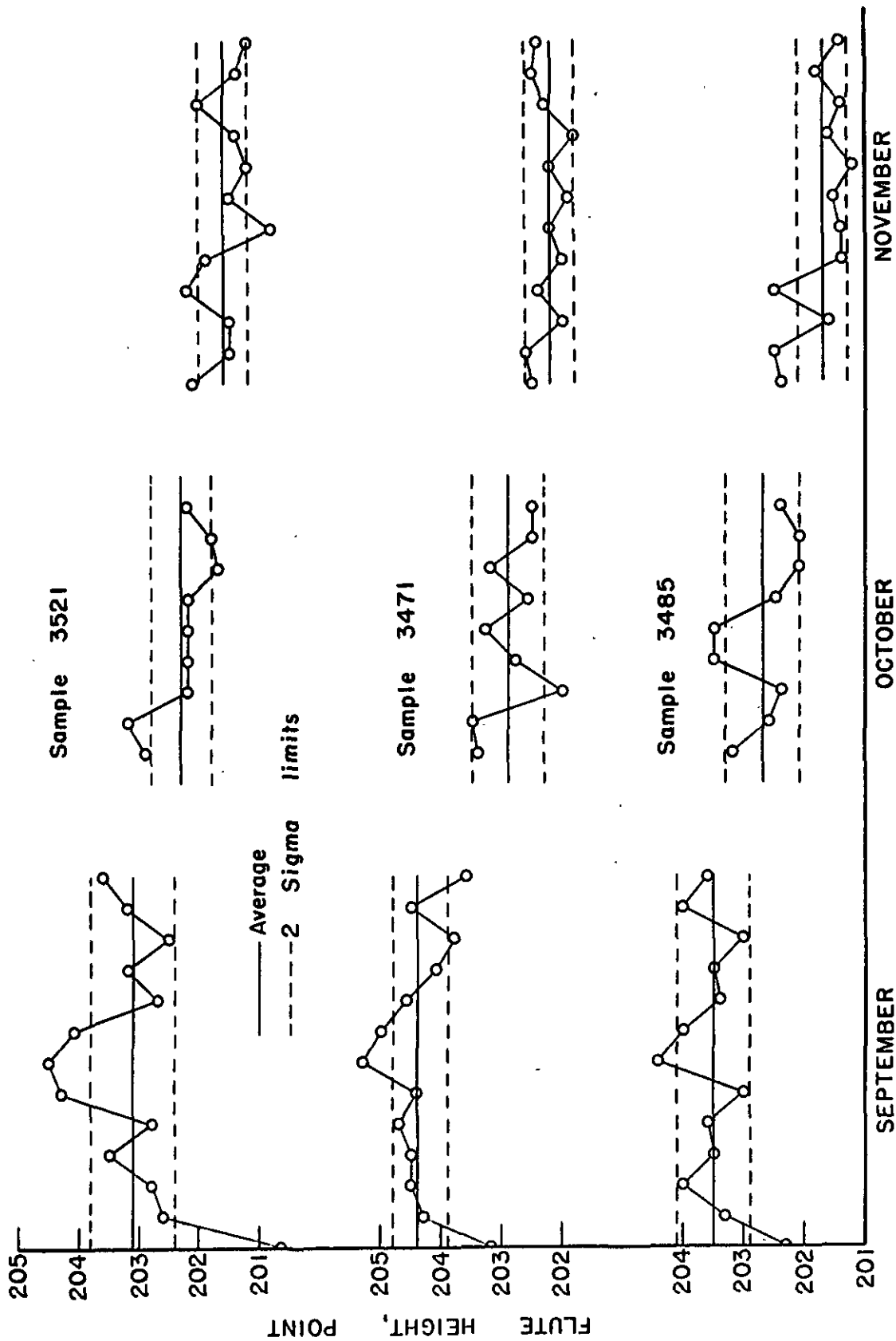


Figure 2: Flute Height Results for 26-lb. Medium Samples

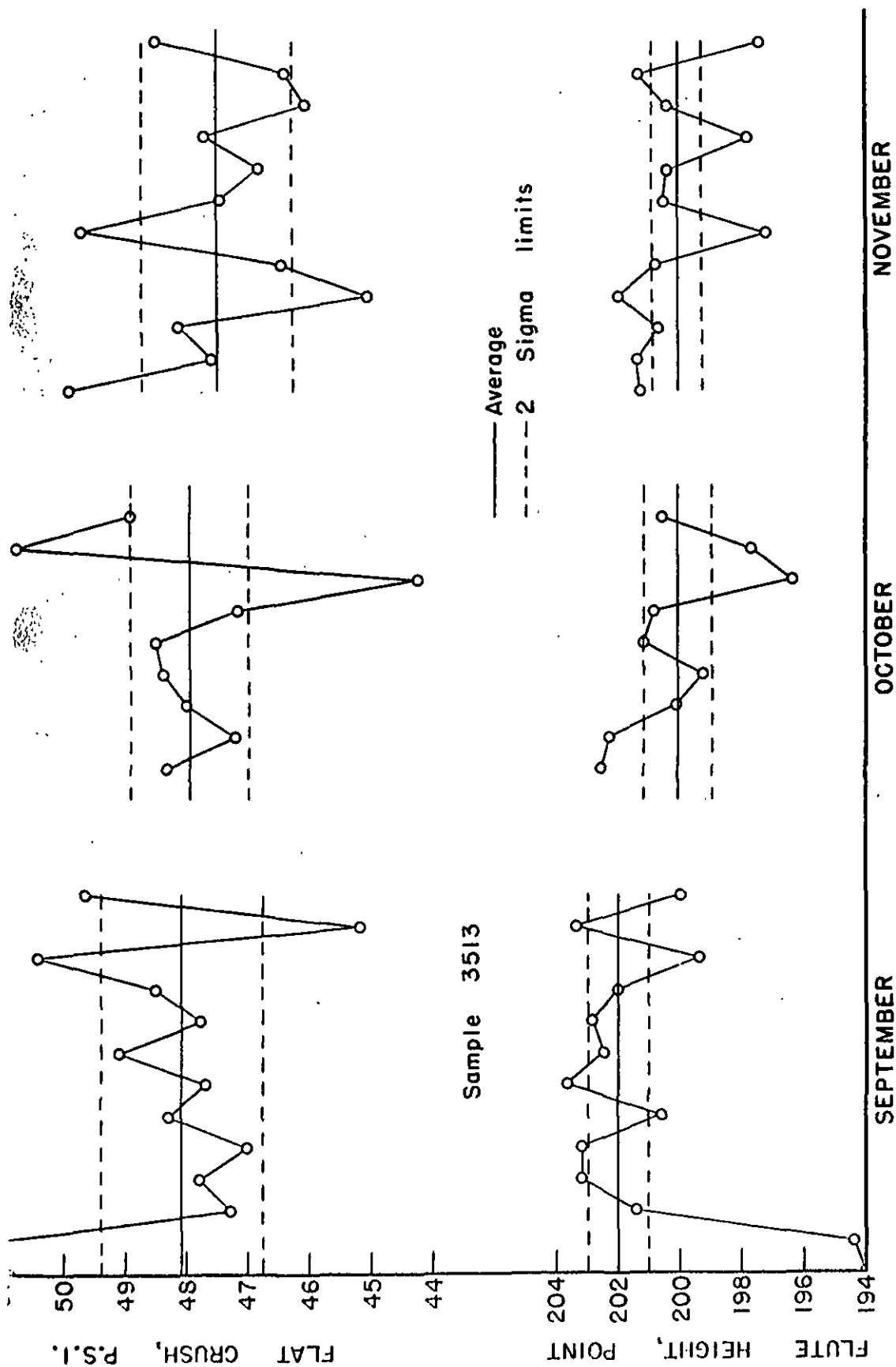


Figure 3. Flat Crush and Flute Height Results for 33-lb. Medium Sample